



OIPE

## RAW SEQUENCE LISTING

DATE: 01/19/2002

PATENT APPLICATION: US/09/943,857

TIME: 11:07:09

Input Set : A:\08919-066001.TXT

Output Set: N:\CRF3\01192002\I943857.raw

ENTERED

```

4 <110> APPLICANT: Shaw, Jei-Fu
5      Lee, Guan-Chiun
6      Tang, Shye-Jye
8 <120> TITLE OF INVENTION: RECOMBINANT CANDIDA RUGOSA LIPASES
11 <130> FILE REFERENCE: 08919-066001
13 <140> CURRENT APPLICATION NUMBER: 09/943,857
14 <141> CURRENT FILING DATE: 2001-08-31
16 <160> NUMBER OF SEQ ID NOS: 11
18 <170> SOFTWARE: FastSEQ for Windows Version 4.0
20 <210> SEQ ID NO: 1
21 <211> LENGTH: 1469
22 <212> TYPE: DNA
23 <213> ORGANISM: Candida rugosa
25 <400> SEQUENCE: 1
26 gccacgcca cctcgccaac ggcgacacca tcaccggtct caacgccatt gtcaacgaaa      60
27 agttttctcg catacgttt gccgagccgc ccgtgggcac tccgcttcaa gctcaacggc      120
28 cagcagttta cctacggccc gtgcatgcag atgaacctta tgggctcggt tcattgggtgc      180
29 tccagtccaa gatottccaa gtggtgcttc ccaacgacga ggactgtctc accaccaggg      240
30 ccagtgtctg tctcccggtg atgctctgga tctttggcgg tgggtttgag cttggcggct      300
31 ccagcctctt tccaggagac cagatggtgg ccaagagcgt gctcatgggt aaaccggtga      360
32 tccacgtgag catgaactac cgcgtggcgt catgggggtt cttggccggc cccgacatcc      420
33 agaacgaagg cagcgggaac gccggcttgc atgaccagcg cttggccatg cagtgggtgg      480
34 cggacaacat tgetgggttt ggcgggcacc cgagcaaggt gaccatatac ggcgaggcgg      540
35 qcagcatgtc gacgtttgtg cactttgtgt ggaacgacgg cgacaacacg tacaacggca      600
36 agcgttgttt ccgcgcgcgc atcatgcagg gctgcatggt gccggaccgg gtggacggca      660
37 cgtacggcac cgagatctac aaccagggtg tggcgtctgc cgggtgtggc agtgccagcg      720
38 acaagctcgc gtgcttgccg gccctttctc aggacacggt gtaccaggcc acgagcgaca      780
39 cgcgcggcgt gttggcgta cgcgtgttgc gttgtatct cccgcggccc gacggcacct      840
40 tcatcaccga cgacatgtat gccttggtgc gggacggcaa gtacgcacac gtgccggtga      900
41 tcatcggcga ccagaacgac gagggcactt tgtttgggct cttgaacgtg accacagatg      960
42 ctcaggcaag ggcgtacttc aagcagttca tccacgccag cgatgcggag atcgacacgt      1020
43 tgatggcggc gtacaccagc gacatcacc agggctcgtt cgacaccggc atcttcaatg      1080
44 ccatcaccgc gcagttcaaa cggatcgctt tgccttgcca ccttgcttcc acgcttgccg      1140
45 gtcgctactt cctcaactac taccaggggc gcaccaagta ctgcttctca agcagcttgg      1200
46 gttgcccgtc ttgggcacct tccacggcaa cgacatcatc tggcaggact acttggtggg      1260
47 cagcggcagt gtgatctaca acaacgcgtt cattgcgttt gccaacgacc tcgaccggaa      1320
48 caaggcgggc ttgtggacca actggcccaa gtacaccagc agcagggcaa caacttgatg      1380
49 cagatcaacg gcttgggggt gtacaccggc aaggacaact tccgcccgga tgcgtacagc      1440
50 gccctctttt ccaacccgcc ttctttgtg      1469
52 <210> SEQ ID NO: 2
53 <211> LENGTH: 547
54 <212> TYPE: PRT
55 <213> ORGANISM: Candida rugosa

```

## RAW SEQUENCE LISTING

DATE: 01/19/2002

PATENT APPLICATION: US/09/943,857

TIME: 11:07:09

Input Set : A:\08919-066001.TXT

Output Set: N:\CRF3\01192002\I943857.raw

57 &lt;400&gt; SEQUENCE: 2

```

58 Ser Met Asn Ser Arg Gly Pro Ala Gly Arg Leu Gly Ser Val Pro Thr
59 1 5 10 15
60 Ala Thr Leu Ala Asn Gly Asp Thr Ile Thr Gly Leu Asn Ala Ile Val
61 20 25 30
62 Asn Glu Lys Phe Leu Gly Ile Pro Phe Ala Glu Pro Pro Val Gly Ser
63 35 40 45
64 Leu Arg Phe Lys Pro Pro Val Pro Tyr Ser Ala Ser Leu Asn Gly Gln
65 50 55 60
66 Gln Phe Thr Ser Tyr Gly Pro Ser Cys Met Gln Met Asn Pro Met Gly
67 65 70 75 80
68 Ser Phe Glu Asp Thr Leu Pro Lys Asn Ala Leu Asp Leu Val Leu Gln
69 85 90 95
70 Ser Lys Ile Phe Gln Val Val Leu Pro Asn Asp Glu Asp Cys Leu Thr
71 100 105 110
72 Ile Asn Val Ile Arg Pro Pro Gly Thr Arg Ala Ser Ala Gly Leu Pro
73 115 120 125
74 Val Met Leu Trp Ile Phe Gly Gly Gly Phe Glu Leu Gly Gly Ser Ser
75 130 135 140
76 Leu Phe Pro Gly Asp Gln Met Val Ala Lys Ser Val Leu Met Gly Lys
77 145 150 155 160
78 Pro Val Ile His Val Ser Met Asn Tyr Arg Val Ala Ser Trp Gly Phe
79 165 170 175
80 Leu Ala Gly Pro Asp Ile Gln Asn Glu Gly Ser Gly Asn Ala Gly Leu
81 180 185 190
82 His Asp Gln Arg Leu Ala Met Gln Trp Val Ala Asp Asn Ile Ala Gly
83 195 200 205
84 Phe Gly Gly Asp Pro Ser Lys Val Thr Ile Tyr Gly Glu Ser Ala Gly
85 210 215 220
86 Ser Met Ser Thr Phe Val His Leu Val Trp Asn Asp Gly Asp Asn Thr
87 225 230 235 240
88 Tyr Asn Gly Lys Pro Leu Phe Arg Ala Ala Ile Met Gln Ser Gly Cys
89 245 250 255
90 Met Val Pro Ser Asp Pro Val Asp Gly Thr Tyr Gly Thr Glu Ile Tyr
91 260 265 270
92 Asn Gln Val Val Ala Ser Ala Gly Cys Gly Ser Ala Ser Asp Lys Leu
93 275 280 285
94 Ala Cys Leu Arg Gly Leu Ser Gln Asp Thr Leu Tyr Gln Ala Thr Ser
95 290 295 300
96 Asp Thr Pro Gly Val Leu Ala Tyr Pro Ser Leu Arg Leu Ser Tyr Leu
97 305 310 315 320
98 Pro Arg Pro Asp Gly Thr Phe Ile Thr Asp Asp Met Tyr Ala Leu Val
99 325 330 335
100 Arg Asp Gly Lys Tyr Ala His Val Pro Val Ile Ile Gly Asp Gln Asn
101 340 345 350
102 Asp Glu Gly Thr Leu Phe Gly Leu Ser Ser Leu Asn Val Thr Thr Asp
103 355 360 365
104 Ala Gln Ala Arg Ala Tyr Phe Lys Gln Ser Phe Ile His Ala Ser Asp
105 370 375 380

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/943,857

DATE: 01/19/2002

TIME: 11:07:09

Input Set : A:\08919-066001.TXT

Output Set : N:\CRF3\01192002\I943857.raw

```

106 Ala Glu Ile Asp Thr Leu Met Ala Ala Tyr Thr Ser Asp Ile Thr Gln
107 385                      390                      395                      400
108 Gly Ser Pro Phe Asp Thr Gly Ile Phe Asn Ala Ile Thr Pro Gln Phe
109                      405                      410                      415
110 Lys Arg Ile Ser Ala Leu Leu Gly Asp Leu Ala Phe Thr Leu Ala Arg
111                      420                      425                      430
112 Arg Tyr Phe Leu Asn Tyr Tyr Gln Gly Gly Thr Lys Tyr Ser Phe Leu
113                      435                      440                      445
114 Ser Lys Gln Leu Ser Gly Leu Pro Val Leu Gly Thr Phe His Gly Asn
115                      450                      455                      460
116 Asp Ile Ile Trp Gln Asp Tyr Leu Val Gly Ser Gly Ser Val Ile Tyr
117 465                      470                      475                      480
118 Asn Asn Ala Phe Ile Ala Phe Ala Asn Asp Leu Asp Pro Asn Lys Ala
119                      485                      490                      495
120 Gly Leu Trp Thr Asn Trp Pro Thr Tyr Thr Ser Ser Ser Gln Ser Gly
121                      500                      505                      510
122 Asn Asn Leu Met Gln Ile Asn Gly Leu Gly Leu Tyr Thr Gly Lys Asp
123                      515                      520                      525
124 Asn Phe Arg Pro Asp Ala Tyr Ser Ala Leu Phe Ser Asn Pro Pro Ser
125                      530                      535                      540
126 Phe Phe Val
127 545
129 <210> SEQ ID NO: 3
130 <211> LENGTH: 1532
131 <212> TYPE: DNA
132 <213> ORGANISM: Candida rugosa
134 <400> SEQUENCE: 3
135 gccaccgccc aagctcgcca acggcgacac catcacccgt ctcaacgcca tcatcaacga      60
136 ggcgttcctc ggcattccct ttgccgagcc gccggtgggc aacctccgct tcaaggaccc      120
137 tgtgccgtac tctggctcgc tcaacggcca gaagttactt acggcccgtg catgcagcag      180
138 aaccccgagg gcacgtttga agagaacctt ggcaagacgg cactcgactt ggtgatgcag      240
139 tccaaggtgt tccaggcggg gcttccccag agtgaggact gcctcaccat caacgtgggtg      300
140 cgcccgccgg gcaccaaggg gggcgccaac ctcccggcca tgcctctggat ctttggcggg      360
141 gggtttgaga tcggcagccc caccatcttc cctcccggcc agatgggtcac caagagtgtg      420
142 ctcatgggca agccatcate cacgtggccg tcaactaccg tgttgccctg tgggggttct      480
143 tggctggtga tgacatcaag gccgagggca gcgggaacgc cggcttgaag gaccagcgtt      540
144 tgggcatgca gtgggtggca gacaacattg ccgggttcgg cggcgaccgg agcaaggtga      600
145 catctttggc gaggcgggca gcatgtccgt gttgtgccac ctcatctgga acgacggcga      660
146 caacacgtac aagggcaagc cgttggttcg cgcgggcacc atgcagggag ccatggtgcc      720
147 ggaccgggtg gacggcacgt acggcaacga gatctacgac ctctttgtct cgagtgtctg      780
148 ctgtggcagc gccagcgaca agctcgcgtg cttgcgcagt gcgagcgaca ccttgcctga      840
149 tgccaccaac aacactcctg ggttctttgg gtactcctcg ttgcggttgt actcccgccc      900
150 cgacggcaag aacatcaccg atgacatgta caagttggtg cgcgacggca agtatgcaag      960
151 cgttcccgtg atcattggcg accagaacga cgagggcacc atctttggct cttgaacgtg      1020
152 accacgaatg ctacggcccc tgettacttc aagcagttca tccacgccag cgacgaggag      1080
153 atcgacacct tgatggcggc gtacccccag gacatcacc aggttcggtt cgacacggtt      1140
154 caacgctcac ccgcagttc aagagaatcg cgggtgctcg cgacctgca ttcateccag      1200
155 ccgcgcgcta ctctctcaac cacttcacgg gcggcaccac gtactcgttc ctcaagcagc      1260
156 tcgggttgcc aatcatgggc accttccatg ccaacgacat tgtgtggcag gactacttgt      1320

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/943,857

DATE: 01/19/2002

TIME: 11:07:09

Input Set : A:\08919-066001.TXT

Output Set: N:\CRF3\01192002\I943857.raw

```

157 tgggaagcgg cagcgtcate tacaacaacg cgtttatcgc gtlcgccacc gacttggacc 1380
158 ccaacaccgc ggggttggtg gtgaactggc ccaagtacac cagcagccag ggcaacaact 1440
159 tgatgatgat caacgccttg ggtttgtaca ccggcaagga caacttcgc accgctggct 1500
160 acgaecggtt gatgaccaac ccgttctttg tg 1532
162 <210> SEQ ID NO: 4
163 <211> LENGTH: 547
164 <212> TYPE: PRT
165 <213> ORGANISM: Candida rugosa
167 <400> SEQUENCE: 4
168 Ser Met Asn Ser Arg Gly Pro Ala Gly Arg Leu Gly Ser Val Pro Thr
169 1 5 10 15
170 Ala Lys Leu Ala Asn Gly Asp Thr Ile Thr Gly Leu Asn Ala Ile Ile
171 20 25 30
172 Asn Glu Ala Phe Leu Gly Ile Pro Phe Ala Glu Pro Pro Val Gly Asn
173 35 40 45
174 Leu Arg Phe Lys Asp Pro Val Pro Tyr Ser Gly Ser Leu Asn Gly Gln
175 50 55 60
176 Lys Phe Thr Ser Tyr Gly Pro Ser Cys Met Gln Asn Pro Glu Gly
177 65 70 75 80
178 Thr Phe Glu Glu Asn Leu Gly Lys Thr Ala Leu Asp Leu Val Met Gln
179 85 90 95
180 Ser Lys Val Phe Gln Ala Val Leu Pro Gln Ser Glu Asp Cys Leu Thr
181 100 105 110
182 Ile Asn Val Val Arg Pro Pro Gly Thr Lys Ala Gly Ala Asn Leu Pro
183 115 120 125
184 Val Met Leu Trp Ile Phe Gly Gly Gly Phe Glu Ile Gly Ser Pro Thr
185 130 135 140
186 Ile Phe Pro Pro Ala Gln Met Val Thr Lys Ser Val Leu Met Gly Lys
187 145 150 155 160
188 His Ile Ile His Val Ala Val Asn Tyr Arg Val Ala Ser Trp Gly Phe
189 165 170 175
190 Leu Ala Gly Asp Ile Lys Ala Glu Gly Ser Gly Asn Ala Gly Leu
191 180 185 190
192 Lys Asp Gln Arg Leu Gly Met Gln Trp Val Ala Asp Asn Ile Ala Gly
193 195 200 205
194 Phe Gly Gly Asp Pro Ser Lys Val Thr Ile Phe Gly Glu Ser Ala Gly
195 210 215 220
196 Ser Met Ser Val Leu Cys His Leu Ile Trp Asn Asp Gly Asp Asn Thr
197 225 230 235 240
198 Tyr Lys Gly Lys Pro Leu Phe Arg Ala Gly Ile Met Gln Ser Gly Ala
199 245 250 255
200 Met Val Pro Ser Asp Pro Val Asp Gly Thr Tyr Gly Asn Glu Ile Tyr
201 260 265 270
202 Asp Leu Phe Val Ser Ser Ala Gly Cys Gly Ser Ala Ser Asp Lys Leu
203 275 280 285
204 Ala Cys Leu Arg Ser Ala Ser Ser Asp Thr Leu Leu Asp Ala Thr Asn
205 290 295 300
206 Asn Thr Pro Gly Phe Leu Ala Tyr Ser Ser Leu Arg Leu Ser Tyr Leu
207 305 310 315 320

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/943,857

DATE: 01/19/2002

TIME: 11:07:09

Input Set : A:\08919-066001.TXT

Output Set: N:\CRF3\01192002\I943857.raw

```

208 Pro Arg Pro Asp Gly Lys Asn Ile Thr Asp Asp Met Tyr Lys Leu Val
209           325           330           335
210 Arg Asp Gly Lys Tyr Ala Ser Val Pro Val Ile Ile Gly Asp Gln Asn
211           340           345           350
212 Asp Glu Gly Thr Ile Phe Gly Leu Ser Ser Leu Asn Val Thr Thr Asn
213           355           360           365
214 Ala Gln Ala Arg Ala Tyr Phe Lys Gln Ser Phe Ile His Ala Ser Asp
215           370           375           380
216 Ala Glu Ile Asp Thr Leu Met Ala Ala Tyr Pro Gln Asp Ile Thr Gln
217 385           390           395           400
218 Gly Ser Pro Phe Asp Thr Gly Val Leu Asn Ala Leu Thr Pro Gln Phe
219           405           410           415
220 Lys Arg Ile Ser Ala Val Leu Gly Asp Leu Ala Phe Ile His Ala Arg
221           420           425           430
222 Arg Tyr Phe Leu Asn His Phe Gln Gly Gly Thr Lys Tyr Ser Phe Leu
223           435           440           445
224 Ser Lys Gln Leu Ser Gly Leu Pro Ile Met Gly Thr Phe His Ala Asn
225           450           455           460
226 Asp Ile Val Trp Gln Asp Tyr Leu Leu Gly Ser Gly Ser Val Ile Tyr
227 465           470           475           480
228 Asn Asn Ala Phe Ile Ala Phe Ala Thr Asp Leu Asp Pro Asn Thr Ala
229           485           490           495
230 Gly Leu Leu Val Asn Trp Pro Lys Tyr Thr Ser Ser Ser Gln Ser Gly
231           500           505           510
232 Asn Asn Leu Met Met Ile Asn Ala Leu Gly Leu Tyr Thr Gly Lys Asp
233           515           520           525
234 Asn Phe Arg Thr Ala Gly Tyr Asp Ala Leu Met Thr Asn Pro Ser Ser
235           530           535           540
236 Phe Phe Val
237 545

```

239 &lt;210&gt; SEQ ID NO: 5

240 &lt;211&gt; LENGTH: 1548

241 &lt;212&gt; TYPE: DNA

242 &lt;213&gt; ORGANISM: Candida rugosa

244 &lt;400&gt; SEQUENCE: 5

```

245 gcccaactgcc acgtctgccca acggcgacac catcaccggg ctcaacgccca tcatcaacga      60
246 ggcgttcctc ggtattccct ttgctcagcc gccggtgggc aacctccgct tcaagccgcc      120
247 tgtgccgtac tggcgctctc tcaatgggtc gaagtttact gtatggccct gtgcatgcag      180
248 atgaacccat tgggcaactg ggactcctcg ctccccaagg ctgccatcaa cttgatgcag      240
249 tccaagctct tccaggcggt gcttcctaac ggcgaggact gtctcaccat caacgtggtg      300
250 cggccggggca ccaagccggg tgccaacctc cccgtgatgg tgtggatttt tggcggcggg      360
251 tttagaggtt ggcgtccag tctcttcct cccgcacaga tgatcacgcg cagcgtgctt      420
252 atgggcaagc ccatacatca cgtgagcatg aactaccgcg ttgcttcgtg ggggttcttg      480
253 gctgggtccag acatcaaggc cgagggcagc gggaacgcgc gtttgcaaga ccaacgcttg      540
254 ggtttgcagt ggggtggcgga caacattgcc ggggttcggcg gcgaccgcgc caaggtgacc      600
255 atctttggtg agggcgggga gcatgtcggt aatgtgtcag ctctcttgga acgacggcga      660
256 caacacgtac aacggcaagc cgttggttcg tgcggccatc atgcaggggg ccatggtgcc      720
257 gggaccgcgt ggatgggccc tacggcacgc agatctacga ccaggtggtt gcttcagccg      780
258 gctgtggcag tgccagcgac aagctcgctt gcttgccgag catcgaacga caaactcttc      840

```

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/943,857

DATE: 01/19/2002

TIME: 11:07:10

Input Set : A:\08919-066001.TXT

Output Set: N:\CRF3\01192002\I943857.raw